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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/016,309 | 11/02/2001 | Mohamed A. Megahed | 01CON279P | 4718 |

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EXAMINER

CHAMBLISS, ALONZO

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|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2827

DATE MAILED: 08/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/016,309 | MEGAHED ET AL. | |
| | Examiner | Art Unit | |
| | Alonzo Chambliss | 2827 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

1. Amendment A filed on 5/22/03 has been fully considered and made of record in Paper No. 5.

Response to Arguments

2. Applicant's arguments filed 5/22/03 have been fully considered but they are not persuasive.

Applicant alleges that Merrill does not provide an inductor wherein the inductance of the inductor is determined and controlled by means of a first selected dimension is measure along a first axis substantially perpendicular to the top surface of the semiconductor die. This argument is deemed unpersuasive because Merrill discloses in Fig. 3 that a conduction path that reduces the electromagnetic field interaction between bonding wire segments and therefore, increases the inductance for a given bonding wire length. The inductance is at least in part a function of the enclosed by the inductor loop (see col. 7 lines 5-35). Thus, the area enclosed is measure along a first axis substantially perpendicular to the top surface of the semiconductor die. Furthermore, applicant states in his remarks on page 8, second paragraph that Merrill teaches wherein an inductance of the inductor is increase by increasing a loop height of the bonding wires 173a-173d, and wherein decreasing the loop height of the bonding wire decreases the inductance of the inductor. Thus, the loop height (i.e. measure along a first axis substantially perpendicular to the top surface of the semiconductor die) is

determined and controlled by the height of the wire between terminal pads. Therefore, the non-final rejection is maintained and this action is made final.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-20, insofar as definite, are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Merrill et al. (U.S. 5,886,393).

With respect to Claim 1, 2, 8, 10, 11, and 15, Merrill teaches a semiconductor die 28 having a source bond pad 172a (i.e. first semiconductor bond pad) and a destination bond pad 172b (i.e. second semiconductor bond pad) attached to a top surface of said semiconductor die 28 (see Fig. 5). It should be noted that any one of the bonding pads 172a-172d can be a source bond pad or destination bond pad. A stud bump 175 is situated on said destination bond pad 172b. A bonding wire 173a (i.e. first conductor) provides a connection between the source bond pad 172a and the stud bump 175. Merrill discloses in Fig. 3 that a conduction path that reduces the electromagnetic field interaction between bonding wire segments and therefore, increases the inductance for a given bonding wire length. The inductance is at least in part a function of the area enclosed by the inductor loop (see col. 5 lines 5-35). Thus, the area enclosed is measured along a first axis substantially perpendicular to the top surface of the

semiconductor die. Furthermore, applicant states in his remarks on page 8, second paragraph that Merrill teaches wherein an inductance of the inductor is increase by increasing a loop height of the bonding wires 173a-173d, and wherein decreasing the loop height of the bonding wire decreases the inductance of the inductor. Thus, the loop height (i.e. measure along a first axis substantially perpendicular to the top surface of the semiconductor die) is determined and controlled by the height of the wire between terminal pads. The first end of the bonding wire 173a is bonded to the source bond pad 172a while the second end of the bonding wire 173a is bonded to the stud bump 175. A bonding wire 173b provides a connection between the second semiconductor bond pad 172b and a third semiconductor bond pad 172c. The source bond pad 172a being a first terminal of the inductor and the destination bond pad 173b being a second terminal of the inductor (see col. 6 lines 42-67; Figs. 5 and 6).

With respect to Claims 3 and 16, since the bonding terminal pads may be readily modified depending upon the specific type of bond or bonds applied as stated in col. 4 lines 42-46 and col. 7 lines 33-42. Merrill teaches wherein a first end of the bonding wire 173a is ball bonded to the source bond pad 173b (see Fig. 5).

With respect to Claims 4 and 17, since the bonding terminal pads may be readily modified depending upon the specific type of bond or bonds applied as stated in col. 4 lines 42-46 and col. 7 lines 33-42. Merrill teaches wherein a second end of the bonding wire 173a is stitch bonded to the stud bump 175 (see Fig. 6).

With respect to Claims 5, 6, 12, 18, and 19, Merrill teaches the source and destination pads 142a-142d are not used to establish an electrical connection between

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the semiconductor die 128 and a substrate (i.e. a die pad connected to lead fingers 126 of a lead frame 122 (see col. 5 lines 62-67 and col. 6 lines 1-11; Fig. 4). The source and destination bond pads 172a, 172b and a third semiconductor die bond pad 172c are for an inductive assembly (i.e. specialized operation for the chip). The inductance is further defined by at least a second selected dimension of the bonding wire, wherein the second selected dimension is measured along a second axis substantially parallel (i.e. the distance between terminal pads) to the top surface of the semiconductor die 28 (see col. 5 lines 5-35 and col. 6 lines 42-67).

With respect to Claims 7, 14, and 20, Merrill teaches wherein an inductance of the inductor is increased by increasing a first selected dimension (i.e. loop height) of the bonding wires 173a-173d, and wherein the inductance of the inductor is decreased by decreasing the first selected dimension (i.e. loop height) of the bonding wires 173a-173d (see col. 5 lines 3-34).

With respect to Claim 9, since the bonding terminal pads may be readily modified depending upon the specific type of bond or bonds applied as stated in col. 4 lines 424fi and col. 7 lines 33-42. Merrill teaches a stud bump 175 situated on the second semiconductor die bond pad 172b, wherein the bonding wire 173b provides the connection between the stud bump and the third semiconductor die bond pad 172c (see Fig. 5).

With respect to Claim 13, Merrill teaches a second conductor 173c providing connection between the third semiconductor die bond pad 172c and a fourth semiconductor die bond pad 172d (see Fig. 5).

The prior art made of record and not relied upon is cited primarily to show the product of the instant invention.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

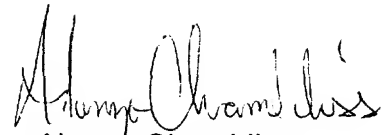
Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (703) 306-9143. The fax phone number for this Group is (703) 308-7722 or 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956

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AC/August 11, 2003



Alonzo Chambliss
Patent Examiner
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